REMARKS

By this reply, claims 1, 2, 4, 5, 14 and 16 have been amended. Claims 1-20 are pending in the application. No new matter has been added to the application by the amendments. Reconsideration and allowance are respectfully requested in view of the following remarks.

Personal Interview

Applicants thank Examiners Ellington and Noori for the courtesies extended to their undersigned representative during the interview conducted on September 14, 2005. Applicants' separate record of the substance of the interview is incorporated in the following remarks.

Allowable Subject Matter

Applicants gratefully acknowledge that claims 2 and 5 have been indicated to contain allowable subject matter. Claims 2 and 5 have been rewritten in independent form including the combined features of claims 1 and 2 and claims 1, 4 and 5, respectively (but not including the amendments to claim 1 set forth above), and thus are allowable. It respectfully submitted that all of the pending claims are patentable for the following reasons.

First Rejection Under 35 U.S.C. § 103

Claims 1, 4 and 6-20 stand rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,701,615 to Harding et al. ("Harding") in view of U.S. Patent No. 4,739,261 to Sugiyama et al. ("Sugiyama"). The rejection is respectfully traversed.

Claim 1, as amended, recites "a method of detecting and quantifying a subsurface crack in an article made of high strength non-magnetisable materials after using the article in a high temperature environment, the article exhibiting a crack on a surface, the method comprising the steps of: (a) brazing the crack using a filler material having an electrical conductivity different from the electrical conductivity of the non-magnetisable materials; and (b) detecting and quantifying by means of a multi-frequency scanning eddy current system any subsurface cracks that remain beneath the brazed crack after the brazing" (emphasis added). Support for the recitation of "using a filler material having an electrical conductivity different from the electrical conductivity of the non-magnetisable materials" is found at page 5, first full paragraph, and at page 6, first full paragraph to page 7, first paragraph, of the specification.

As was discussed during the interview, the method recited in claim 1 can detect and quantify "subsurface cracks" that remain after repairing a surface crack by brazing. A "surface crack" is a crack that initiates at a surface. A "subsurface crack" is a crack within the article, but with no outlet to the surface. Fig. 2 shows a surface crack 8 prior to brazing, and Fig. 3 shows the crack after brazing. Brazing material 9 does not fill the entire crack, thereby leaving a subsurface crack 10 within the article. Such subsurface cracks can be detected and quantified by the method recited in claim 1.

As was also discussed during the interview, brazing utilizes a filler material that can be melted and flowed into a crack. The filler material used for brazing has a different electrical conductivity than that of the base material. This difference in conductivity allows the detection of braze defects by multi-frequency eddy current

measurement, as claimed. In contrast, welding does not use a filler material different from the base materials; thus, there is no difference in electrical conductivity that can be detected by an eddy current measurement.

Harding discloses a method and an inspection and sorting system 100 for part repair. The system shown in Fig. 1 for inspecting the part 10 includes a sensor 30, which can measure "dimensions, and number, location, and size of flaws in part, such as cracks" (column 3, lines 39-41). Harding disclose the use of fluorescent penetrant inspection (FPI) for detecting cracks in the part (column 6, lines 19-43). However, such FPI technique is only applicable to detecting surface cracks, and not to detecting subsurface cracks, which have no outlet to the surface.

As was discussed during the interview, Harding also does not disclose or suggest the use of brazing, but only discloses the use of welding. Harding thus does not suggest "brazing the crack using a filler material having an electrical conductivity different from the electrical conductivity of the non-magnetisable materials," or "detecting and quantifying by means of a multi-frequency scanning eddy current system any subsurface cracks that remain beneath the brazed crack after the brazing," as recited in claim 1.

Applicants respectfully submit that Sugiyama also fails to disclose or suggest the brazing of a crack, much less detecting and quantifying a subsurface crack that remains beneath a brazed crack. Accordingly, Sugiyama fails to provide the required motivation to modify Harding to result in the method recited in claim 1. Thus, claim 1 is patentable over the applied references.

Claims 4 and 6-13, which depend from claim 1, are also patentable.

Claim 14, as amended, recites "a method of detecting and quantifying a subsurface crack in a blade or vane of a gas turbine made of high strength non-magnetisable materials after using the blade or vane in a high temperature environment, the blade or vane having a crack on a surface, the method comprising: brazing the crack using a filler material having an electrical conductivity different from the electrical conductivity of the non-magnetisable materials; and detecting and quantifying using a multi-frequency scanning eddy current system any subsurface cracks that remain beneath the brazed crack after the brazing." The method recited in Claim 14 is also patentable over the applied references for reasons stated above.

Claims 15-20, which depend from claim 14, are also patentable.

Therefore, withdrawal of the rejection is respectfully requested.

Second Rejection Under 35 U.S.C. § 103

Claim 3 stands rejected under 35 U.S.C. § 103(a) over Harding in view of U.S. Patent No. 4,285,459 to Baladjanian et al. ("Baladjanian")[1]. The rejection is respectfully traversed.

Claim 3 depends from claim 1. The Office Action acknowledges that Harding fails to suggest the features of claim 3. Sugiyama also fails to suggest the recited features. However, it is asserted in the Office Action that Baladjanian discloses a method that is applied to blades or vanes of gas turbines made from nickel base superalloy.

[1] As claim 3 depends from claim 1, it is assumed that this ground of rejection is based on Harding in view of Sugiyama and Baladjanian.

Applicants submit that Baladjanian fails to cure the above-described deficiencies of Harding and Sugiyama with regard to the method recited in claim 1. Accordingly, claim 3 also would not have been rendered obvious.

Therefore, withdrawal of the rejection is respectfully requested.

Conclusion

For the foregoing reasons, allowance of the application is respectfully requested. If there are any questions concerning this response, to expedite prosecution, the Examiner is respectfully requested to contact the undersigned at the number given below.

Respectfully submitted,

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